Information (16:00), February 19, 2025

To All Missions (Embassies, Consular posts and International Organizations in Japan)

Report on the discharge record and the seawater monitoring results at Fukushima Daiichi Nuclear Power Station during November

The Ministry of Foreign Affairs wishes to provide all international Missions in Japan with a report on the discharge record and seawater monitoring results with regard to groundwater pumped from the sub-drain and groundwater drain systems, as well as bypassing groundwater pumped during the month of November at Fukushima Daiichi Nuclear Power Station (NPS).

1. Summary of decommissioning and contaminated water management

In November the summary of monthly progress on decommissioning and contaminated water management of Fukushima Daiichi NPS was issued shown in Appendix 1. For more information, please see the following URL:
https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/mp202411.pdf

2. Sub-drain and Groundwater Drain Systems

In November purified groundwater pumped from the sub-drain and groundwater drain systems was discharged on the dates shown in Appendix 2. Prior to every discharge, an analysis on the quality of the purified groundwater to be discharged was conducted by Tokyo Electric Power Company (TEPCO) and the results were announced.

All the test results during the month of November have confirmed that the radiation levels of sampled water were substantially below the operational targets set by TEPCO (these operational targets are well below the density limit specified by the Reactor Regulation). The results of these analyses were also confirmed by third-party organization (Tohoku Ryokka Kankyohozen Co.).

In addition, TEPCO and Japan Atomic Energy Agency (JAEA), at the request of the Government of Japan, regularly conduct more detailed analyses on the purified groundwater. The results of JAEA's latest analyses confirmed that TEPCO's analyses were accurate and verified that the radiation levels of sampled groundwater was substantially below the operational target (see Appendix 3).

Moreover, TEPCO publishes the results of analyses conducted on seawater sampled during the discharge operation at the nearest seawater sampling post from

the discharge point (see Appendix 4). The results show that the radiation levels of seawater remain lower than the density limit specified by the Reactor Regulation and significant change in the radioactivity has not been observed.

2. Groundwater Bypassing

In November, the pumped bypassing groundwater was discharged on the dates shown in Appendix 5. Prior to every discharge, an analysis on the quality of the groundwater to be discharged was conducted by TEPCO and the results were announced.

All the test results during the month of November have confirmed that the radiation levels of sampled water were substantially below the operational targets set by TEPCO (these operational targets are well below the density limit specified by the Reactor Regulation). The results of these analyses were also confirmed by Japan Chemical Analysis Center.

In addition, TEPCO and JAEA, at the request of the Government of Japan, regularly conduct more detailed analyses on the groundwater. The results of JAEA's latest analyses confirmed that TEPCO's analyses were accurate and verified that the radiation levels of the sampled groundwater were substantially below the operational target (see Appendix 6).

Moreover, TEPCO publishes analysis results on seawater sampled during the discharge operation at the nearest seawater sampling post from the discharge point (see Appendix 7). The result shows that the radiation levels in seawater remain lower than the density limit specified by the Reactor Regulation and significant change in the radioactivity has not been observed. The analysis had been conducted once a month until March 2017. Since April 2017, it is conducted four times a year because there has been no significant fluctuation in the concentration of radioactive materials in the sea water, and no influence on the surrounding environment has been confirmed.

The sampling process for analyses conducted this month is the same as the one conducted in the information disseminated last month. Results of the analyses are shown in the attached appendices:

(For further information, please contact TEPCO at (Tel: 03-6373-1111) or refer to the TEPCO's website:
https://www.tepco.co.jp/en/nu/fukushima-np/handouts/index-e.html
Contact: International Nuclear Energy Cooperation Division,
Ministry of Foreign Affairs, Tel 03-5501-8227

Outline of Decommissioning, Contaminated Water and Treated Water Management

November 28, 2024
Secretariat of the Team for Countermeasures for Decommissioning, Contaminated Water and Treated Water

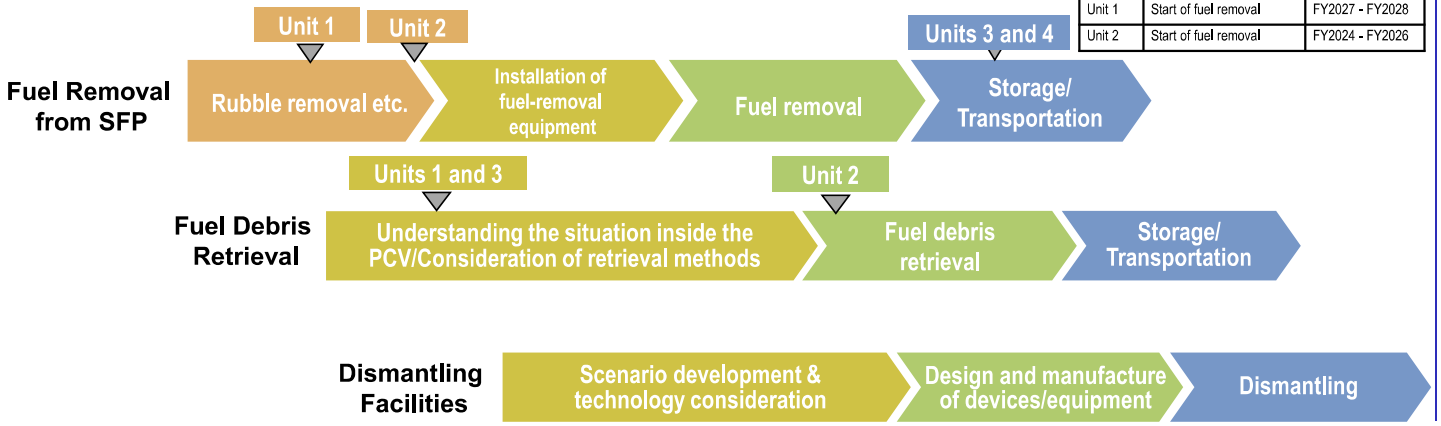
Main decommissioning work and steps

Fuel removal from the spent fuel pool was completed on December 22, 2014 at Unit 4 and February 28, 2021 at Unit 3.
Trial fuel debris retrieval at Unit 2 commenced from September 10, 2024 and a milestone of the Mid- and Long-Term Roadmap "Commencing fuel debris retrieval at the first Unit" was achieved.
Work continues sequentially toward the start of fuel removal from Units 1 and 2 and fuel debris (Note 1) retrieval from Units 1-3.

(Note 1) Fuel assemblies having melted through in the accident with nearby metal materials etc.

<Milestones in the Mid- and Long-Term Roadmap>

Units 1-6	Completion of fuel removal	Within 2031
Unit 1	Start of fuel removal	FY2027 - FY2028
Unit 2	Start of fuel removal	FY2024 - FY2026



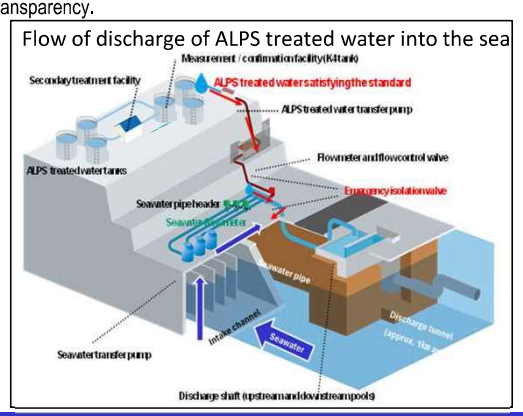
Measures for treated water

Appendix1

Handling of ALPS treated water

Regarding the discharge of ALPS treated water into the sea, TEPCO must comply with regulatory and other safety standards to safeguard the public, the surrounding environment and agricultural, forestry and fishery products. To minimize adverse impacts on reputation, efforts including enhanced monitoring, ensuring objectivity and transparency by engaging with third-party experts and having safety checked by the IAEA, will continue. Moreover, accurate information will be disseminated with full transparency.

Flow of discharge of ALPS treated water into the sea



Contaminated water management - triple-pronged efforts -

(1) Efforts to promote contaminated water management based on the three basic policies

① "Remove" the source of water contamination ② "Redirect" fresh water from contaminated areas ③ "Retain" contaminated water from leakage

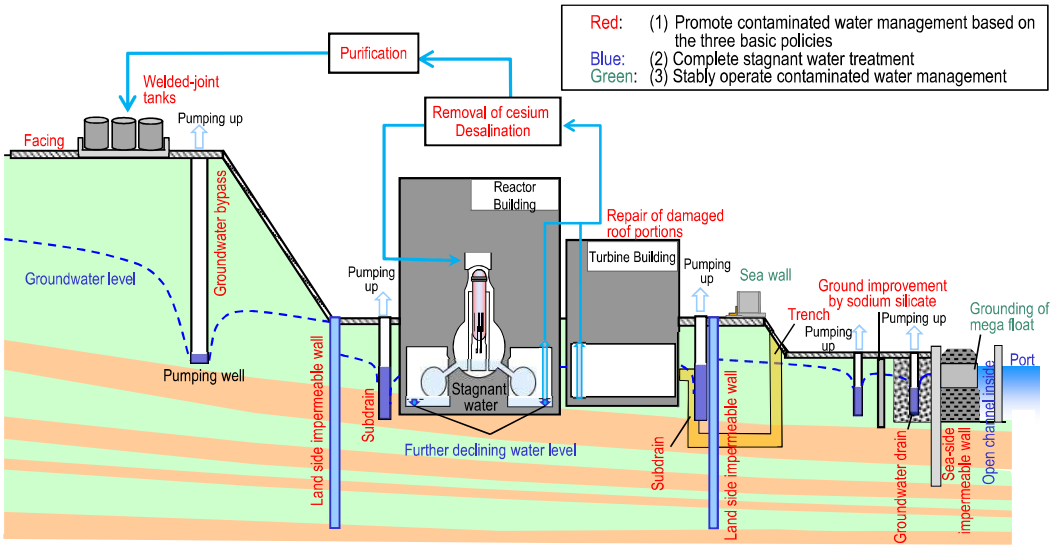
- Strontium-reduced water from other equipment is being re-treated in the Advanced Liquid Processing System (ALPS: multi-nuclide removal system) and stored in welded-joint tanks.
- Multi-layered contaminated water management measures, including land-side impermeable walls and subdrains, have stabilized the groundwater at a low level and the increased contaminated water generated during rainfall is being suppressed by repairing damaged portions of the building roofs facing onsite. Through these measures, the generation of contaminated water has been suppressed and reduced, from approx. 540 m^3/day (in May 2014) before implementing measures to approx. 80 m^3/day (in FY2023), achieving the milestone of "suppressing the amount of contaminated water generated to 100 m^3/day or less during average rainfall within FY2025."
- Measures will proceed to further reduce the amount of contaminated water generated and suppress it to approx. 50-70 m^3/day by FY2028.

(2) Efforts to complete stagnant water treatment

- To reduce the stagnant water levels in buildings as planned, work to install additional stagnant water transfer equipment is underway.
- In 2020, treatment of stagnant water in buildings was completed, except for the Unit 1-3 Reactor Buildings, Process Main Building and High-Temperature Incinerator Building.
- While assessing the dust impact, measures to reduce the stagnant water level were implemented. In March 2023, the target water level in each building was achieved. For the Units 1-3 Reactor Buildings, "reducing stagnant water in the Reactor Buildings to about half the amount at the end of 2020 during the period FY2022-2024" was achieved.
- For zeolite sandbags on the basement floors of the Process Main Building and High-Temperature Incinerator Building, measures to reduce the radiation dose are being examined with stabilization in mind.

(3) Efforts to stably operate contaminated water management

- As part of the tsunami countermeasures, openings in buildings were closed and work to install sea walls was completed. As countermeasures for heavy rain, sandbags are being installed to suppress direct inflow into buildings while work to enhance drainage channels and other measures is being implemented as planned.



Progress Status and Future Challenges of the Mid-and-Long-Term Roadmap toward Decommissioning of TEPCO Holdings Fukushima Daiichi Nuclear Power Station (Outline)

Progress status

◆ The temperatures of the Reactor and the Primary Containment Vessel of Units 1-3 have been maintained stable.
There was no significant change in the concentration of radioactive materials newly released from Reactor Buildings into the air. It was concluded that the comprehensive cold shutdown state had been maintained.

Unit 2 Progress of trial fuel debris retrieval

On November 7, Unit 2 trial fuel debris retrieval using the telescopic device was completed.

Sampled fuel debris was transported to the Japan Atomic Energy Agency (JAEA) Oarai Nuclear Engineering Institute on November 12.

The transported fuel debris will be analyzed over a period of several months to approximately one year and the data acquired will be leveraged to determine fuel debris retrieval methods, safety measures and storage methods to be implemented in future.

<Off-site transportation cask mounted on the off-site transportation vehicle>

Unit 1 Results of the in-house accessibility survey in the vicinity of X-25 penetration

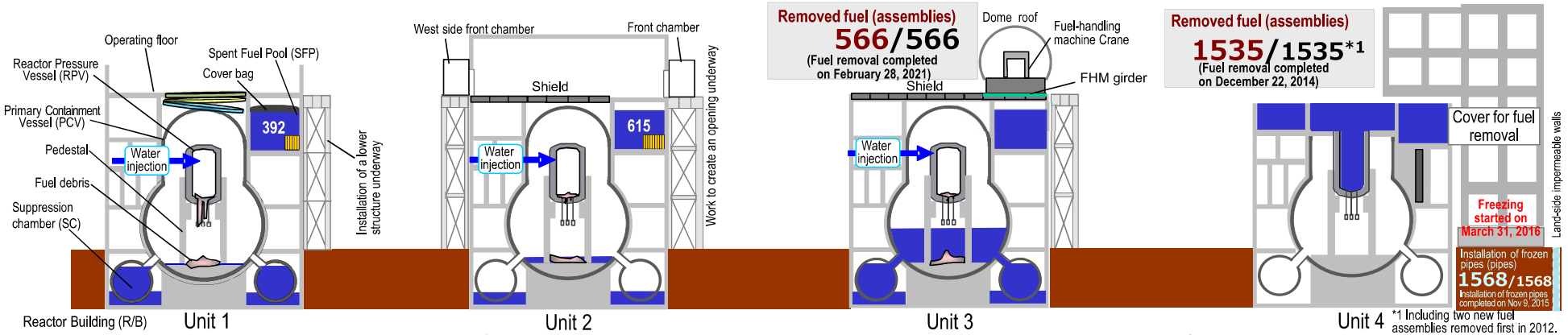
To clarify the accident progression and develop plans for environmental improvement inside the reactor buildings, investigations of the Units 1-3 Reactor Buildings have been underway.

In FY2021, high dose rates were detected in the vicinity of the Unit 1 X-25 penetration (near the shielding blocks).

As preliminary confirmation before investigating inside the shielding blocks, where high dose rates were detected, accessibility was confirmed using an in-house crawler robot on November 19, and no structures hindering drone flight were identified.

Going forward, consideration and preparations will be made for the investigation in the vicinity of the X-25 penetration using a combination of crawler robots and drones.

<In-house crawler robot>



Discharge of ALPS treated water into the sea

The discharge of ALPS treated water from the measurement/confirmation facility Tank Group B was completed on November 4.

The measurement/confirmation facility is currently being inspected based on the conservation plan and the inspection of Tank Group C. The inspection inside Tank Group C detected paint peeling, slight rust and other damage at the tank bottom, but it was confirmed that they would have no impact on the soundness of tanks. Accordingly, repair painting was applied.

In preparation for the 7th discharge of ALPS treated water in FY2024, transfer to Tank Group C commenced from November 27.

Regarding tritium in seawater, TEPCO will continue confirming that it is being discharged safely as planned, while meeting the discharge requirement based on quick daily analyses.

Unit 2 Progress toward fuel removal

Before installing the fuel-removal system, work to create an opening on the south side of the Unit 2 Reactor Building operating floor is underway. Work to pull down the wall commenced from November 23.

Moreover, work to install runway garter steel frames commenced from October 24, which involved carrying three of eight blocks into the south side gantry.

At Units 4 and 3, from which fuel was removed previously, a decline in visibility was detected. To secure visibility during fuel-removal work, purification equipment will be installed in the pool in around the first half of 2025.

<Work to pull down the wall>

Unit 2 Cause, countermeasures and future response to water level decline in the Spent Fuel Pool Skimmer Surge Tank

Work to construct the alternative cooling line and repair of leakage parts were completed on November 14.

An investigation into similar parts (dissimilar material joints) detected corrosion in three other portions, which were then repaired.

To resume circulating cooling, work to clean inside the pipes and trial operation were conducted. After confirming the soundness of the pipes, circulating cooling by the Unit 2 Spent Fuel Pool Primary Cooling System resumed from November 25.

As measures to similar parts of other Units, while prioritizing Unit 1 where fuel remains, an investigation into dissimilar material joints will be implemented.

Appendix 2

Results of analyses on the quality of the purified groundwater pumped from the sub-drain and groundwater drain systems at Fukushima Daiichi NPS (made available by TEPCO prior to discharge)

(Unit: Bq/L)

Date of sampling *Date of discharge	Detected nuclides	Analytical body	
		TEPCO	Third-party organization
November 26th, 2024 *Discharged on December 1st	Cs-134	ND (0.58)	ND (0.66)
	Cs-137	ND (0.86)	ND (0.54)
	Gross β	ND (1.9)	ND (0.32)
	H-3	650	700
November 25th, 2024 *Discharged on November 30th	Cs-134	ND (0.67)	ND (0.63)
	Cs-137	ND (0.71)	ND (0.63)
	Gross β	ND (1.8)	ND (0.36)
	H-3	720	750
November 23rd, 2024 *Discharged on November 28th	Cs-134	ND (0.88)	ND (0.62)
	Cs-137	ND (0.75)	ND (0.60)
	Gross β	ND (2.0)	ND (0.34)
	H-3	780	830
November 21st, 2024 *Discharged on November 26th	Cs-134	ND (0.82)	ND (0.51)
	Cs-137	ND (0.67)	ND (0.63)
	Gross β	ND (1.8)	ND (0.34)
	H-3	880	950
November 19th, 2024 *Discharged on November 24th	Cs-134	ND (0.58)	ND (0.44)
	Cs-137	ND (0.62)	ND (0.58)
	Gross β	ND (0.67)	ND (0.33)
	H-3	830	880
November 17th, 2024 *Discharged on November 22nd	Cs-134	ND (0.84)	ND (0.58)
	Cs-137	ND (0.74)	ND (0.58)
	Gross β	ND (2.1)	ND (0.30)
	H-3	710	780
November 16th, 2024 *Discharged on November 21st	Cs-134	ND (0.61)	ND (0.83)
	Cs-137	ND (0.59)	ND (0.63)
	Gross β	ND (1.9)	ND (0.31)
	H-3	720	780
November 14th, 2024 *Discharged on November 19th	Cs-134	ND (0.58)	ND (0.59)
	Cs-137	ND (0.63)	ND (0.66)
	Gross β	ND (1.8)	ND (0.33)

	H-3	620	640
November 13th,2024 *Discharged on November 18th	Cs-134	ND (0.98)	ND (0.59)
	Cs-137	ND (0.78)	ND (0.54)
	Gross β	ND (1.9)	ND (0.29)
	H-3	560	580
November 12th, 2024 *Discharged on November 17th	Cs-134	ND (0.80)	ND (0.62)
	Cs-137	ND (0.72)	ND (0.58)
	Gross β	ND (1.7)	ND (0.36)
	H-3	560	560
November 11th, 2024 *Discharged on November 16th	Cs-134	ND (0.67)	ND (0.67)
	Cs-137	ND (0.67)	ND (0.66)
	Gross β	ND (1.9)	ND (0.34)
	H-3	560	570
November 10th, 2024 *Discharged on November 15th	Cs-134	ND (0.56)	ND (0.58)
	Cs-137	ND (0.59)	ND (0.51)
	Gross β	ND (0.65)	ND (0.35)
	H-3	530	580
November 9th, 2024 *Discharged on November 14th	Cs-134	ND (0.58)	ND (0.41)
	Cs-137	ND (0.49)	ND (0.66)
	Gross β	ND (1.9)	ND (0.36)
	H-3	530	570
November 8th, 2024 *Discharged on November 13th	Cs-134	ND (0.84)	ND (0.67)
	Cs-137	ND (0.75)	ND (0.54)
	Gross β	ND (1.7)	ND (0.36)
	H-3	530	540
November 7th, 2024 *Discharged on November 12 th	Cs-134	ND (0.92)	ND (0.41)
	Cs-137	ND (0.66)	ND (0.51)
	Gross β	ND (1.8)	ND (0.32)
	H-3	470	490
November 6th, 2024 *Discharged on November 11th	Cs-134	ND (0.93)	ND (0.67)
	Cs-137	ND (0.63)	ND (0.69)
	Gross β	ND (1.8)	ND (0.38)
	H-3	550	560
November 5th, 2024 *Discharged on November 10th	Cs-134	ND (0.91)	ND (0.48)
	Cs-137	ND (0.80)	ND (0.78)
	Gross β	ND (1.7)	0.51
	H-3	610	630
November 4th, 2024 *Discharged on November 9th	Cs-134	ND (0.58)	ND (0.70)
	Cs-137	ND (0.69)	ND (0.63)
	Gross β	ND (1.9)	0.44
	H-3	660	680

November 3rd, 2024 *Discharged on November 8th	Cs-134	ND (0.53)	ND (0.55)
	Cs-137	ND (0.64)	ND (0.83)
	Gross β	ND (2.1)	0.50
	H-3	680	730
November 1st, 2024 *Discharged on November 6th	Cs-134	ND (0.66)	ND (0.58)
	Cs-137	ND (0.66)	ND (0.51)
	Gross β	ND (0.68)	0.38
	H-3	790	850
October 31 st, 2024 *Discharged on November 5th	Cs-134	ND (0.67)	ND (0.67)
	Cs-137	ND (0.72)	ND (0.69)
	Gross β	ND (2.1)	ND (0.37)
	H-3	840	870
October 30th, 2024 *Discharged on November 4th	Cs-134	ND (0.69)	ND (0.42)
	Cs-137	ND (0.74)	ND (0.54)
	Gross β	ND (2.1)	0.42
	H-3	810	860
October 28th, 2024 *Discharged on November 2nd	Cs-134	ND (0.78)	ND (0.64)
	Cs-137	ND (0.61)	ND (0.54)
	Gross β	ND (1.9)	ND (0.38)
	H-3	750	780

- * ND: represents a value below the detection limit; values in ( ) represent the detection limit.
- In order to ensure the results, third-party organizations have also conducted an analysis and verified the radiation level of the sampled water.
- Third-party organization : Tohoku Ryokka Kankyohozen Co., Ltd

Appendix 3

Result of detailed analyses conducted by TEPCO, JAEA, and Japan Chemical Analysis Center (In order to confirm the validity of analysis, the Government of Japan also requests JAEA; and TEPCO requests Japan Chemical Analysis Center to conduct independent analyses)

(Unit: Bq/L)

Date of sampling	Detected nuclides	Analytical body		
		JAEA	TEPCO	Japan Chemical Analysis Center
October 1st,2024	Cs-134	ND (0.0030)	ND (0.0046)	ND (0.0055)
	Cs-137	0.0031±0.00059	ND (0.0041)	ND (0.0051)
	Gross α	ND (0.62)	ND (2.2)	ND (1.8)
	Gross β	ND (0.38)	ND (0.74)	ND (0.59)
	H-3	680 ±1.5	670	680
	Sr-90	ND(0.0016)	ND (0.0015)	ND (0.0068)

* ND: represents a value below the detection limit; values in ( ) represent the detection limit.

(Reference) (Unit: Bq/L)

Radionuclides	Operational Targets	Density Limit specified by the Reactor Regulation	World Health Organization (WHO) Guidelines for Drinking Water Quality
Cs-134	1	60	10
Cs-137	1	90	10
Gross α	—	—	—
Gross β	3 (1) ※	—	—
H-3	1,500	60,000	10,000
Sr-90	—	30	10

※ The operational target of Gross β is 1 Bq/L in the survey which is conducted once every ten days.

※ The reference table shows the values of operational targets before discharge. Since the values after discharge contain natural radioactive materials in seawater, there will be differences between the values and the operational targets values.

Appendix 4

Results of analysis on the seawater sampled near the discharge point (North side of Units 5 and 6 discharge channel)

(Unit: Bq/L)

Date of sampling	Detected nuclides	Sampling point (South discharge channel)
September 11th, 2024 *Sampled before discharge of purified groundwater.	Cs-134	ND (0.68)
	Cs-137	ND (0.78)
	Gross β	11
	H-3	ND (0.28)

Appendix 5

Results of analyses on the water quality of the groundwater pumped up for bypassing at Fukushima Daiichi NPS (made available by TEPCO prior to discharge)

(Unit: Bq/L)

Date of sampling *Date of discharge	Detected nuclides	Analytical body	
		TEPCO	Third-party organization
November 22nd, 2024 *Discharged on November 28th	Cs-134	ND (0.65)	ND (0.60)
	Cs-137	ND (0.64)	ND (0.78)
	Gross β	ND (0.72)	ND (0.31)
	H-3	34	36
November 15th, 2024 *Discharged on November 21st	Cs-134	ND (0.84)	ND (0.68)
	Cs-137	ND (0.86)	ND (0.78)
	Gross β	ND (0.61)	ND (0.32)
	H-3	31	34
November 8th, 2024 *Discharged on November 14th	Cs-134	ND (0.79)	ND (0.48)
	Cs-137	ND (0.65)	ND (0.51)
	Gross β	ND (0.63)	ND (0.32)
	H-3	36	43
November 2nd, 2024 *Discharged on November 8th	Cs-134	ND (0.61)	ND (0.64)
	Cs-137	ND (0.70)	ND (0.58)
	Gross β	ND (0.65)	ND (0.30)
	H-3	37	39

- * ND: represents a value below the detection limit; values in ( ) represent the detection limit
- In order to ensure the results, third-party organizations have also conducted an analysis and verified the radiation level of the sampled water.
- Third-party organization: Tohoku Ryokka Kankyohozen Co., Ltd

Result of detailed analyses conducted by TEPCO, JAEA, and Japan Chemical Analysis Center (In order to confirm the validity of analysis, the Government of Japan also requests JAEA; and TEPCO requests Japan Chemical Analysis Center to conduct independent analyses)

(Unit: Bq/L)

Date of sampling	Detected nuclides	Analytical body		
		JAEA	TEPCO	Japan Chemical Analysis Center
October 4th, 2024	Cs-134	ND (0.0026)	ND (0.0050)	ND (0.0056)
	Cs-137	ND (0.0019)	ND (0.0050)	ND (0.0052)
	Gross α	ND (0.56)	ND (2.2)	ND (1.8)
	Gross β	ND (0.47)	ND (0.63)	ND (0.56)
	H-3	51 ±0.44	46	47
	Sr-90	ND (0.0016)	ND (0.0014)	ND (0.0066)

* ND: represents a value below the detection limit; values in ( ) represent the detection limit.

(Reference) (Unit: Bq/L)

Radionuclides	Operational Targets	Density Limit specified by the Reactor Regulation	World Health Organization (WHO) Guidelines for Drinking Water Quality
Cs-134	1	60	10
Cs-137	1	90	10
Gross α	—	—	—
Gross β	5 (1) ※	—	—
H-3	1,500	60,000	10,000
Sr-90	—	30	10

※ The operational target of Gross β is 1 Bq/L in the survey which is conducted once every ten days.

※ The reference table shows the values of operational targets before discharge. Since the values after discharge contain natural radioactive materials in seawater, there will be differences between the values and the operational targets values.

Results of analyses on the seawater sampled near the discharge point (Around South Discharge Channel)

(Unit: Bq/L)

Date of sampling ※conducted four times a year	Detected nuclides	Sampling point (South discharge channel)
September 11th, 2024	Cs-134	ND (0.68)
	Cs-137	ND (0.97)
	Gross β	12
	H-3	ND (0.32)